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(51) INT CL<sup>6</sup>

**F24C 7/00 15/06**

(52) UK CL (Edition P)

**F4W W57**

(56) Documents Cited

**GB 2298073 A GB 2276444 A GB 2275105 A**

**GB 2072832 A GB 1443772 A GB 0975009 A**

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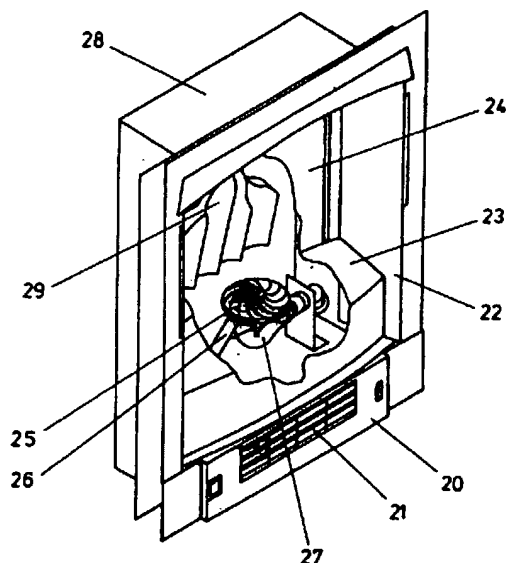
(58) Field of Search

**UK CL (Edition O) F4W W57**

**INT CL<sup>6</sup> F24C 7/00 15/06**

(54) **Flame-effect electric fire**

(57) A flame-effect electric fire comprises a translucent simulated fuel bed 23 and a translucent fire back 24. Light projection means 25, 27 projects light intermittently onto the underside of the simulated fuel bed 23. A reflector 29 having generally upwardly extending flutings and mounted rearwardly of the fire back, receives light from the light projection means 25, 27 and directs at least some of said light onto the rear of the fire back 24.



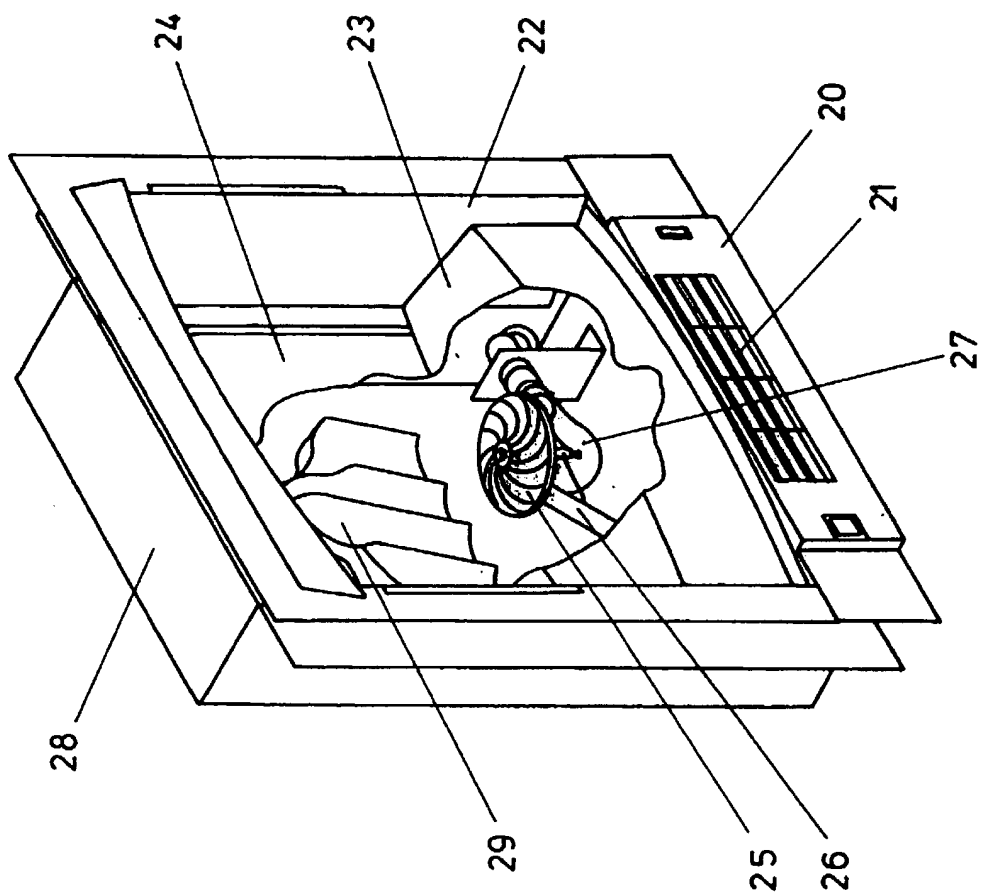


FIG. 2

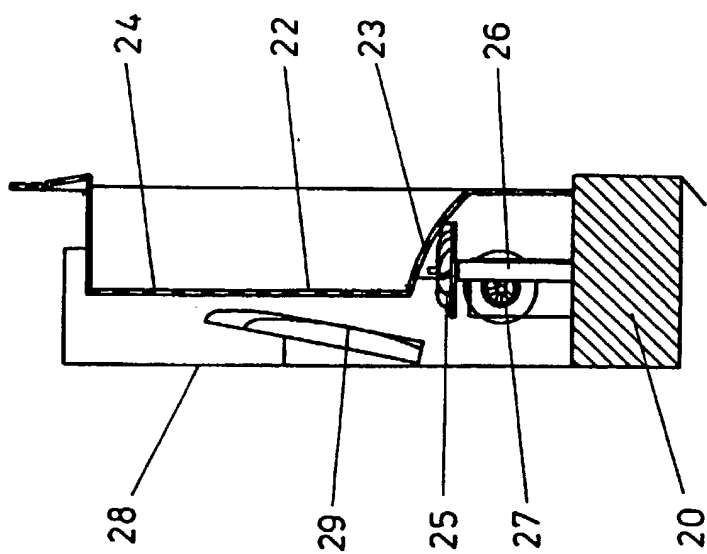


FIG. 1

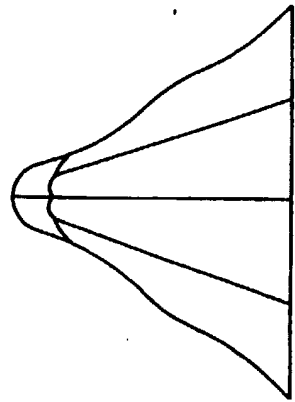


FIG. 3

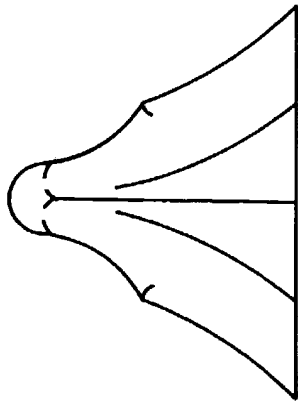


FIG. 4

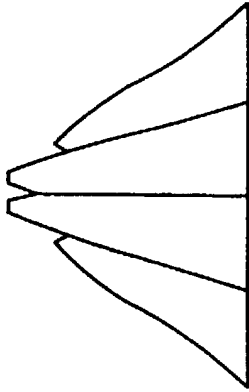


FIG. 5

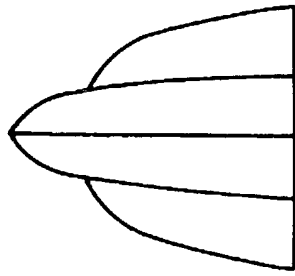


FIG. 6

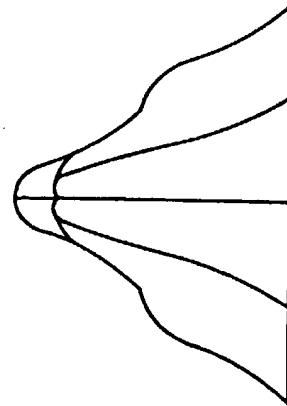


FIG. 7

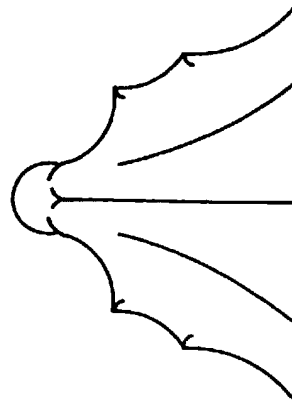


FIG. 8

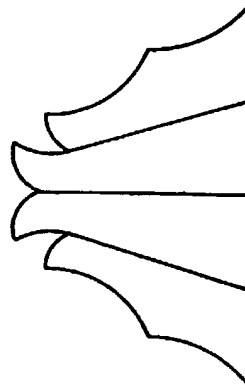


FIG. 9

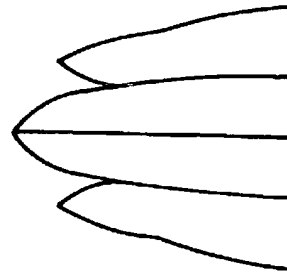


FIG. 10

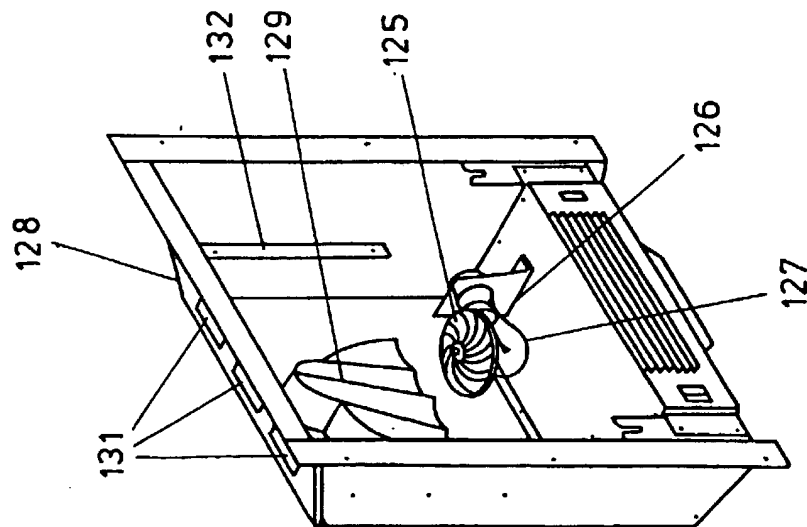


FIG. 11A

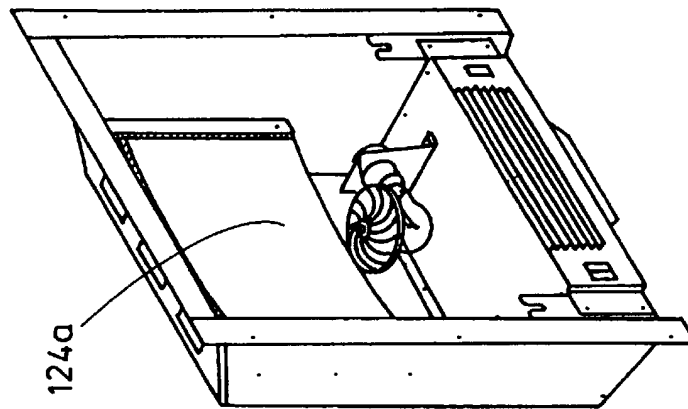


FIG. 11B

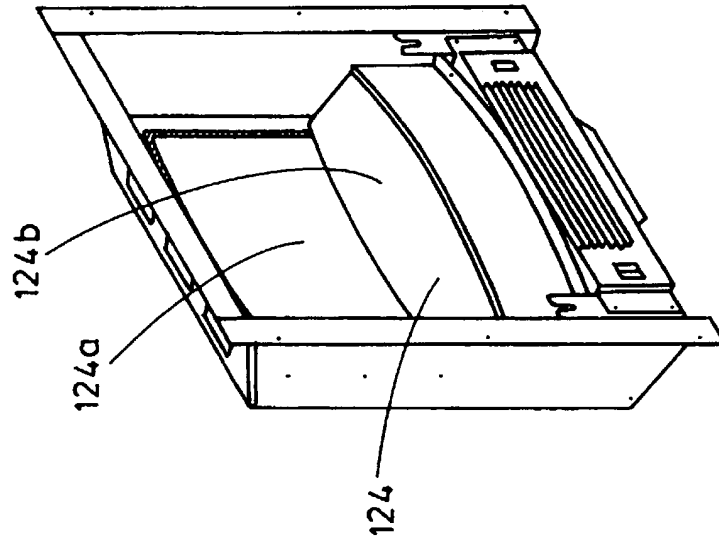


FIG. 11C

### Improved Flame-Effect Fire

The present invention relates to electric fires of the type which incorporate devices to simulate the visual effects of live flames such as would issue from fires burning solid fuel.

While electric fires are a very popular and convenient form of radiant domestic heating, many such fires, especially when they are designed for installation in the opening of a conventional solid fuel fire or upon a hearth, are constructed to give the overall impression of a solid-fuel fire. Thus a moulding to represent the upper surface of a bed of partly-burned solid fuel is a very common feature of such fires.

An important characteristic of a normal solid-fuel fire is the effect produced by flickering flames and it is attempts to produce this effect which have most engaged the designers of electric fuel-effect fires. One common approach has been to provide a vented spinner, mounted for rotation about a vertical axis above a coloured electric bulb. When the bulb is illuminated, the heat rising from the bulb causes the spinner to rotate and, by virtue of the vents in the spinner, a regularly varying coloured light is directed at the underside of the translucent simulated fuel bed. The resulting effect is a crude rhythmic simulation of the light from a flame.

In order to produce a more credible visual effect, one method which has been adopted is to provide a translucent back to the space above the simulated fuel bed and to create a vertical flicker effect on the rear of that fire back by means of

ribbons, held at their ends in a generally upright position and caused to move by a current of air created by a fan.

It is an object of the present invention to provide an improved flame-effect electric fire which displays a good visual effect of the desired type but which is of a simple construction, which is therefore easy to maintain, and which may be manufactured more cheaply than many prior flame-effect fires.

According to the present invention, there is provided a flame-effect electric fire, the fire comprising a translucent simulated fuel bed and a translucent fire back, light projection means for projecting light intermittently on to the underside of the simulated fuel bed, and a reflector having generally upwardly extending flutings and mounted rearwardly of the fire back to receive light from the light projection means and to direct at least some of said light on to the rear of the fire back.

The simulated fuel bed and the fire back preferably comprise a single piece of translucent material, for example shaped by moulding.

Alternatively, the simulated fuel bed and fireback may be formed from separate pieces of translucent material. This provides the advantage of allowing easier maintenance of the fire.

The translucent material is preferably a glass-fibre reinforced plastics material.

The translucent material may be shaped so as to resemble a bed of fuel.

Alternatively, the translucent material may be generally flat and support upon its surface a material to represent the solid fuel, for example washed anthracite.

In a preferred embodiment, the light projection means comprises a vented spinner mounted for rotation about a substantially vertical axis and located above an electric bulb.

The electric bulb is preferably coloured.

The light projection means may be located towards the rear of the simulated fuel bed so that a proportion of the light is directed into a space to the rear of the fire back. This enables a proportion of the light to directly impinge upon the reflector.

The spinner is preferably offset relative to the centre of the bulb so that some of the light from the bulb may directly engage the reflector without first passing through the spinner vents.

The vents through the spinner may advantageously be shaped to varying angles so that light from the bulb passing through the vents may vary in intensity and direction as it impinges upon the underside of the simulated fuel bed, thereby creating a random flame effect within the bed.

The spinner and bulb may be mounted to an integral bracket.

The reflector is a very important feature of the present invention and plays a major role in simulating a flickering flame effect. Light impinging upon the reflector, which as indicated may be a combination of direct light from the bulb and light which has been interrupted and/or diverted by the spinner, is diverted by the flutings while it is being reflected and thereby produces a visual effect upon the rear of the translucent fireback which very convincingly simulates rising random flames, which may appear to rise from a concentration of brightness at their base.

The flutings upon the surface of the reflector are preferably each of a rounded cross-section but may alternatively be angular in cross-section. The cross-sectional shape may be uniform along the length of each fluting or may taper in the direction of the upper end of the fluting. The flutings may be all of equal lateral dimensions or they may differ; for example the outermost flutings may be narrower than the inner ones. They may be all of equal length or they may be of different lengths; for example the outer flutings may be shorter than the inner ones. The flutings may be parallel to each other or may converge in an upward direction.

The fluted reflector, which as indicated is mounted rearwardly of the translucent fire-back, is preferably mounted in an orientation which is forwardly downwardly inclined towards the back of the fireback, in particular towards its lower end adjacent to the simulated fuel bed.

Preferred embodiments of the invention will now be described, by way of example only and not in any limitative sense, with reference to the accompanying drawings, in which:-

Fig. 1 is a vertical sectional view of a first embodiment of the fire;

Fig. 2 is a perspective view, partly cut away, of the fire of Fig. 1;

Figs. 3 to 10 are elevations from the front of eight alternative forms of reflector, illustrated by way of example from among many possible forms; and

Figs. 11A to 11C show three perspective, partly cut away, views of a second embodiment of the fire with varying parts removed.

The fire illustrated in Figs. 1 and 2 is constructed above an



electric fan-assisted heater 20 having electric elements 21 and includes a unitary moulding 22, formed in a translucent fibre-reinforced plastics material, which has a lower section 23, upon which pieces of washed anthracite (not shown) are supported behind a decorative brass front (not shown), so as to simulate a bed of solid fuel, and a section 24 forming the fireback. Below the level of the simulated fuel bed and placed somewhat rearwardly so as to extend beyond the fireback 24, a vented spinner 25 is supported, for rotation about a vertical axis, upon a support bracket 26.

The vents in the spinner 25 are of varying inclinations and dimensions, with the result that light passed through the vents while the spinner is rotating changes its intensity and direction. The spinner 25 is mounted above a coloured electric light bulb 27 but the bulb is displaced somewhat rearwardly relative to the axis of the spinner so that some of the light from the bulb can pass into the space behind the fireback 24 uninterrupted by the spinner.

The rear of the fire is closed by a metal back 28 upon which a fluted reflector 29 is supported. The reflector 29 has generally upwardly extending flutings and is mounted in a downwardly inclined position. When the bulb 27 is illuminated and, by virtue of the heat rising from the bulb, the spinner 25 is caused to rotate, a part of the light from the bulb passes through the vents in the spinner and intermittently and irregularly illuminates the simulated fuel bed from below.

A further part of the light from the bulb passing through the spinner vents, and also light by-passing the spinner to the rear, impinges directly upon the fluted reflector 29 and is both diverted by the flutings and also reflected on to the rear of the fireback 24, which it illuminates in its lower zone as though by flickering flames.

Figs. 3 to 10 illustrate a range of possible forms of the fluted reflector 29. In most of the illustrated reflectors the flutings are inwardly inclined towards each other and taper upwardly. In some, the outer flutings are shorter than the inner ones. In all of the illustrated reflectors there are four flutings but if desired they may be fewer, for example three, or more, for example five or six.

Referring to Figures 11A to 11C, in which parts common to the embodiment of Figures 1 and 2 are denoted by like reference numerals but increased by 100, the reflector 129 comprises a one-piece transparent piece of plastics material which is screwed in place from the rear of the fire. The spinner 125 and bulb 127 are now mounted to an integral bracket 126, which assists in the alignment of the spinner 125 relative to the bulb 127. In addition, a series of three louvres 131 are provided in the top face of the back 128 of the fire to assist air circulation.

The fireback 124 comprises separate fibreglass effect viewing panels 124a and 124b which replace the single section fireback 24 of Figures 1 and 2 and which allow easy maintenance of the fire. Panel 124a is screwed to metal top and side strips, of which only one side strip 132 is shown in the Figures.

The illustrated embodiments of the invention give a good simulation of flickering flames and are simple to construct and to maintain.

It will be appreciated by persons skilled in the art that the above embodiments have been described by way of example only and not in any limitative sense, and that various alterations and modifications are possible without departure from the scope of the invention as defined by the appended claims.

CLAIMS

1. A flame-effect electric fire, the fire comprising a translucent simulated fuel bed and a translucent fire back, light projection means for projecting light intermittently on to the underside of the simulated fuel bed, and a reflector having generally upwardly extending flutings and mounted rearwardly of the fire back to receive light from the light projection means and to direct at least some of said light on to the rear of the fire back.
2. A fire according to Claim 1, wherein the simulated fuel bed and the fire back comprise a single piece of translucent material.
3. A fire according to Claim 1, wherein the simulated fuel bed and fireback are formed from separate pieces of translucent material.
4. A fire according to Claim 2 or 3, wherein the translucent material is a glass-fibre reinforced plastics material.
5. A fire according to any one of Claims 2 to 4, wherein the translucent material is shaped so as to resemble a bed of fuel.
6. A fire according to any one of Claims 2 to 4, wherein the translucent material is generally flat and supports upon its surface a material to represent the solid fuel.
7. A fire according to any one of the preceding Claims, wherein the light projection means comprises a vented spinner mounted for rotation about a substantially vertical axis and located above an electric bulb.
8. A fire according to Claim 7, wherein the electric bulb is coloured.

9. A fire according to Claim 7 or 8 wherein the light projection means is located towards the rear of the simulated fuel bed so that a proportion of the light is directed into a space to the rear of the fire back.

10. A fire according to any one of claims 7 to 9, wherein the spinner is offset relative to the centre of the bulb so that some of the light from the bulb may directly engage the reflector without first passing through the spinner vents.

11. A fire according to any one of claims 7 to 10, wherein the spinner and bulb are mounted to an integral bracket.

12. A fire according to any one of Claims 7 to 11, wherein the vents through the spinner are shaped to varying angles.

13. A fire according to any one of the preceding Claims, wherein the flutings upon the surface of the reflector are each of a rounded cross-section.

14. A fire according to any one of claims 1 to 13, wherein the flutings upon the surface of the reflector are angular in cross section.

15. A fire according to any one of the preceding claims, wherein the reflector is mounted in an orientation which is forwardly downwardly inclined towards the back of the fire back.

16. A fire according to any one of the preceding claims, further comprising a casing having at least one aperture in an upper portion thereof.

17. A flame-effect electric fire, the fire substantially as hereinbefore described with reference to the accompanying drawings.



Application No: GB 9719083.9  
Claims searched: All

Examiner: M C Monk  
Date of search: 30 September 1997

**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): F4W (W57)

Int Cl (Ed.6): F24C (7/00, 15/06)

Other:

**Documents considered to be relevant:**

| Category | Identity of document and relevant passage |   | Relevant to claims |
|----------|---|---|--------------------|
| X        | GB 2298073 A                              | BITECH ENGINEERING<br>Consider whole document; see especially para 3 p.9 - para 1 p.10.   | 1,7 at least       |
| X        | GB 2276444 A                              | UNIDARE ENVIRONMENT LTD<br>Shaped reflector (3).  | 1,7 at least       |
| X        | GB 2275105 A                              | BASIC PATENTS<br>Reflective light producing means (6) - see description on p.9.           | 1,7 at least       |
| X        | GB 2072832 A                              | CANNON INDUSTRIES<br>Protuberances (4).   | 1,7 at least       |
| X        | GB 1443772                                | T I SUNHOUSE<br>Reflector (3).  | 1,7 at least       |
| X        | GB 975009                                 | H FROST<br>Consider whole document; see especially description relating to reflector (8). | 1,7 at least       |
| X        | GB 968568                                 | H FROST<br>Consider whole document.   | 1,7 at least       |

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
& Member of the same patent family

A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
E Patent document published on or after, but with priority date earlier than, the filing date of this application.



# The Patent Office

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Application No: GB 9719083.9  
Claims searched: All

Examiner: M C Monk  
Date of search: 30 September 1997

| Category | Identity of document and relevant passage |                                     | Relevant to claims |
|----------|---|-------------------------------------|--------------------|
| X        | GB 957591                                 | H FROST<br>Consider whole document. | 1,7 at least       |
| X        | GB 713017                                 | SIMPLEX ELECTRIC CO<br>Plate (14).  | 1 at least         |

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|---|---|---|--|
| X | Document indicating lack of novelty or inventive step   | A | Document indicating technological background and/or state of the art.  |
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